

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Office



[bar code]

(43) International publication date
February 3, 2005 (02/03/2005)

PCT

(10) International publication number
WO 2005/010450 A1

(51) International Patent Classification⁷:
F28F 9/013, 9/22

F28D 7/06, (81)

Designated States (*unless otherwise indicated, for all types of available national protection rights*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

(21) International application number.: PCT/DE2004/001439

(22) International filing date:
July 6, 2004 (07/06/2004)

(25) Language in which the international application was originally filed: German

(26) Language in which the international application is published: German

(30) Priority Data:
103 33 463.7 July 22, 20903 (07/22/2003) DE

(71) Applicant (*for all Designated States except US*): **ALSTOM POWER ENERGY RECOVERY GMBH** [DE/DE]; Ellenbacher Strasse 10, 34123 Kassel-Bettenhausen (DE).

(72) Inventors; and

(75) Inventors/Applicants: (*for US only*): **JEKERLE, Jiri**, [DE/DE]; Finkenstrasse 5, 34225 Baunatal (DE). **ROTHENPIELER, Klaus, Dieter**, [DE/DE]; Habichtswalder Strasse 27, 34119 Kassel (DE).

(84) **Designated States** (*unless otherwise indicated, for all types of available regional protection rights*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

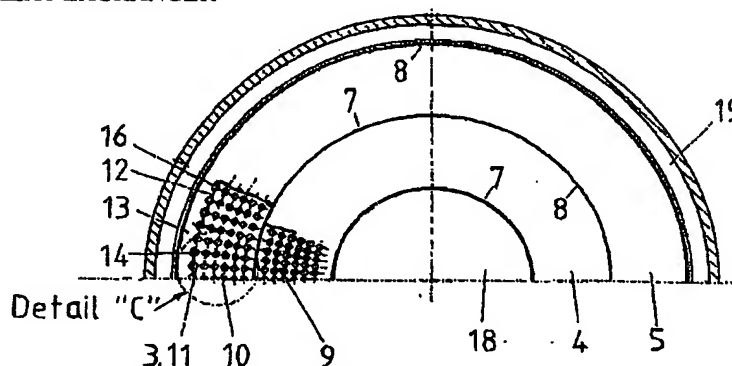
Published

- with International Search Report
- before expiration of the time period allowed for the changing of claims. Publication will be repeated if changes occur.

For an explanation of the two-letter codes and the other abbreviations, refer to the explanations ("Guidance Notes on Codes and Abbreviations") that appear at the beginning of each regular edition of the PCT Gazette.

[Original English]

(54) Title: **TUBE BUNDLE HEAT EXCHANGER**



(57) [Original English] **Abstract:** The invention relates to a tube bundle heat exchanger comprising at least one channel (4, 5) that guides a heating or cooling medium, particularly a hot gas, whereby the tubes (3) of the tube bundles (2) extend in an, in essence, axially parallel manner with regard to the channel longitudinal axis (6) through the channel (4, 5), and the heating or cooling medium is guided through rings (9) and discs (10), which are arranged on and attached to the respective outer walls (7, 8) of the channel (4, 5) in an alternating manner whereby, when viewing in an axial direction of the channel (4, 5), zigzagging through the channel (4, 5) having, in essence, a circular cross-section. Inside at least one channel (4, 5), the rings (9) and discs (10) each accommodate and position all tubes (3) of a channel (4, 5) by means of cylindrical recesses (11), and the perimeter contour (12) of the rings (9) and of the discs (10) follow the mid-points (14, 15) of the outermost or innermost tube bundle tubes (3) on the medium flow-through side (13), whereby the perimeter contour (12) has a limb (16) that surrounds all outer most and innermost tubes (3).

(57) **Abstract:** Tube bundle heat exchanger, having at least one channel (4, 5) that carries a heating or cooling medium, in particular, a heating gas, whereby the tubes (3) of the tube bundle (2) extend essentially axis-parallel to the channel longitudinal axis (6) through the channel (4, 5), and the heating or cooling medium is directed through rings (9) and discs (10), which are arranged on and fastened to the respective jacket walls (7, 8) of the channel (4, 5) in an alternating fashion, in a zigzag pattern as seen in the axial direction of the channel (4, 5), through the channel (4, 5) which exhibits an essentially annular cross section, whereby in at least one channel (4, 5) the rings (9) and discs (10) accommodate and position all the tubes (3) of one channel (4, 5), each by means of cylindrical recesses (11), and the perimeter contour (12) of the rings (9) and discs (10) on the medium flow-through side (13) follow the mid-points (14, 15) of the outermost or innermost tube bundle tubes (3), whereby the perimeter contour (12) includes a web (16) that surrounds all of the outermost or innermost tubes (3).

WO 2005/010450 A1